What is claimed is:

1. An optical transmitter, comprising:

a semiconductor laser light source; and

a traveling-wave optical modulator for modulating output light of the semiconductor laser light source;

wherein:

said traveling-wave optical modulator comprises an external semiconductor modulator disposed on a first substrate, said external semiconductor modulator being capable of modulating output light of the semiconductor laser light source, and a high-frequency line disposed on a second substrate separated from the first substrate; and in said traveling-wave optical modulator, a control electrode for the external semiconductor modulator, which is included in the external semiconductor modulator, is electrically connected to the high-frequency line.

2. An optical transmitter according to Claim 1, wherein:

the first substrate is fixedly secured to the second substrate with an active layer side of the external semiconductor modulator disposed on the first substrate and a high-frequency line side of the second substrate facing each other.

3. An optical transmitter according to Claim 1, wherein:

the external semiconductor modulator has a plurality of active components that are disposed at predetermined intervals cyclically; and

in said traveling-wave optical modulator, each control electrode, which is included in each of the plurality of active components, is electrically connected to the high-frequency line.

4. An optical transmitter according to Claim 3, wherein:

the first substrate is fixedly secured to the second substrate with an active layer side of the external semiconductor modulator disposed on the first substrate and a high-frequency line side of the second substrate facing each other.

5. An optical transmitter according to Claim 2, wherein:

the semiconductor laser light source and the external semiconductor modulator are monolithically integrated.

6. An optical transmitter according to Claim 3, wherein:

the semiconductor laser light source and the external semiconductor modulator are monolithically integrated.

7. An optical transmitter according to Claim 2, wherein:

the semiconductor laser light source and the external semiconductor modulator are hybrid integrated.

8. An optical transmitter according to Claim 3, wherein:

the semiconductor laser light source and the external semiconductor modulator are hybrid integrated.

9. An optical transmitter according to Claim 2, wherein:

the first substrate is made of a compound semiconductor; and

the second substrate is made from one selected from the group of silicon, aluminum nitride, boron nitride, silicon oxide, aluminum oxide, beryllium oxide, silicon carbide, and diamond.

10. An optical transmitter according to Claim 2, wherein:

a drive circuit of the external semiconductor modulator is formed on the second substrate; and

the drive circuit is electrically connected to the high-frequency line.

11. An optical transmitter according to Claim 3, wherein:

the second substrate is formed with a drive circuit of the external semiconductor modulator; and

the drive circuit uses a traveling-wave type output mode, and a traveling-wave output of the drive circuit is

electrically connected to the high-frequency line.

12. An optical transmitter according to Claim 2 further comprising an optical receiver, said optical receiver including a light receiving element disposed on a third substrate; a high-frequency line disposed on a fourth substrate separated from the first semiconductor substrate; and a traveling-wave optical modulator in which an electrode used for detecting an electric output of the light receiving element is electrically connected to the high-frequency line, said electrode being included in the light receiving element; wherein the third substrate is fixedly secured to the fourth substrate with an active layer side of the light receiving element disposed on the third substrate and a high-frequency line side of the fourth substrate facing each other.

13. An optical receiver, comprising:

a light receiving element disposed on a first substrate;

a high-frequency line disposed on a second substrate separated from the first semiconductor substrate; and

a traveling-wave optical modulator in which an electrode used for detecting an electric output of the light receiving element is electrically connected to the high-frequency line, said electrode being included in the light receiving element.

14. An optical receiver according to Claim 13,

wherein:

the first substrate is fixedly secured to the second substrate with an active layer side of the light receiving element disposed on the first substrate and a high-frequency line side of the second substrate facing each other.

15. An optical receiver according to Claim 14, wherein:

the light receiving element has a plurality of light receiving areas that are disposed at predetermined intervals cyclically; and

said optical receiver comprises a traveling-wave optical modulator to which an electrode used for detecting each electric output of the light receiving element is electrically connected, said each electric output being produced in each of the plurality of light receiving areas.

16. An optical receiver according to Claim 14, wherein:

a preamplifier circuit is disposed on the second substrate; and

an input portion of the preamplifier circuit is electrically connected to the high-frequency line.

17. An optical receiver according to Claim 15, wherein:

a preamplifier circuit is disposed on the second substrate; and

the preamplifier circuit uses a traveling-wave type input mode, and an input portion of the preamplifier circuit is electrically connected to the high-frequency line.

18. An optical transmitter according to Claim 17, wherein:

the first substrate and the third substrate are common; and

the second substrate and the fourth substrate are common.

19. A method for manufacturing an optical device comprising the steps of:

measuring an additive capacity value of a semiconductor optical element after a wafer process for the semiconductor optical element is completed;

selecting or manufacturing a high-frequency element mounting substrate, on which a high-frequency line having the most appropriate characteristic impedance value is formed, on the basis of the additive capacity value; and

electrically connecting the semiconductor optical element to the high-frequency element mounting substrate after that.